

#### 2018 MBSS Summer Habitat Assessment Training



Harford Community College May 29, 2018





#### MARYLAND DEPARTMENT OF NATURAL RESOURCES

#### MBSS Summer Habitat

#### **Summer Habitat Certification Regular Summer Habitat Data Sheet Development Data Sheet** Watershed Code Second SITE Reviewer: SITE Reviewer FLOW HABITAT ASSESSMENT BANK EROSION **FLOW** BANK EROSION HABITAT ASSESSMENT Depth (cm) Velocity (m/s) Left Bank Right Bank Left Bank Right Bank 0 0 10 0 0 10 10 Instream Habitat (0-20). Oll 0 0 0 0 0 0 0 0 0 0 0 Instream Habitat (0-20)-Extent (m) Extent (m) 2. Epifaunal Substrate (0-20) 2. Epifaunal Substrate (0-20) Severity \_\_\_ Severity\_ 0 = none 0 = none3. Velocity/Depth Diversity (0-20) 1 = min 3. Velocity/Depth Diversity (0-20) 1 = min 2 = mod3 = severe 4. Pool/Glide/Eddy Quality (0-20). 4. Pool/Glide/Eddy Quality (0-20) Average Average Height (m) Height (m) Extent (m)-Extent (m)-BAR FORMATION & **BAR FORMATION &** 5. Riffle/Run Quality (0-20) 5. Riffle/Run Quality (0-20) SUBSTRATE SUBSTRATE Extent (m)-Cobble Cobble Extent (m)-Severity Severity 0 = none Gravel Gravel 1 = min 6. Embeddedness (%) 6. Embeddedness (%) 2 = mod2 = modSand Sand 3 = severe 3 = severe 7. Shading (%) Silt/Clay Shading (%). STREAM CHARACTER STREAM CHARACTER Braided Gravel Boulder >2m Braided Gravel Boulder >2m Riffle Sand Boulder <2m Riffle Sand Boulder <2m Beaver Pond Run/Glide Silt/Clay Run/Glide Silt/Clay Beaver Pond Deep Pool (>= 0.5m) Cobble Overhead Cover Deep Pool (>= 0.5m) Cobble Overhead Cover Shallow Pool (< 0.5m) Bedrock Undercut Bank Shallow Pool (< 0.5m) Bedrock Undercut Bank Orange Floc Orange Floc P = Present A = Absent E = Extensive P = Present E = Extensive A = Absent

Alternative Flow Measurements

Distance (cm)

Depth (cm)

Width (cm)

Time (sec)



Woody Debris

No. of Instream Woody Debris

No. of Dewatered Woody Debris

No. of Instream Rootwads

MBSS Summer Habitat Certification Development Questions

How many times have you attended MBSS summer habitat training?

At how many field sites have you scored MBSS summer habitat?

Woody Debris

No. of Instream Woody Debris

No. of Dewatered Woody Debris

No. of Instream Rootwads

Maximum Depth (cm)

Depth (cm)

Width (m)

Thalweg

Velocity (m/s)



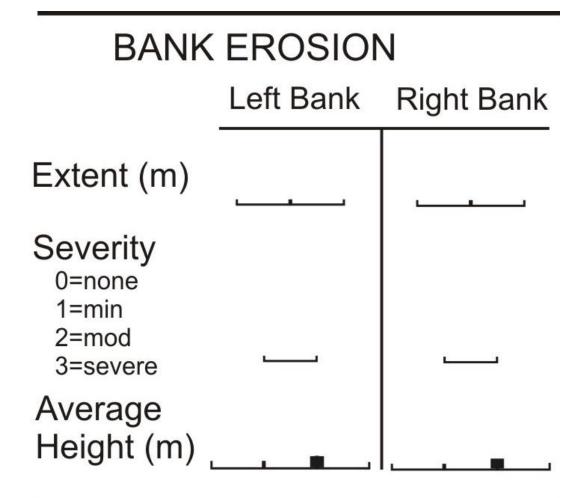
MBSS SUMMER HABITAT DATA SHEET Page						
SITE Watershed Code	Segment Type	Year	Reviewer:	/	cond	
BANK EROSION Left Bank Right Bank Estent (m) Severity 0 = none 1 = min 2 = mod 3 = severe  Avarage Height (m) BAR FORMATION & SUBSTRATE Severity 0 = none 1 = min 2 = mod 3 = severe Silvicias Silvicias	1. Instream Habitat (0-2 2. Epifaunal Substrate (3 3. Velocity/Depth Diven 4. Pool/Gilde/Eddy Qua Extent (m) 5. Riffle/Run Quality (0- Extent (m) 6. Embeddedness (%)	(0-20) sity (0-20)	Lat. Loc. (m)	FLOW Depth (cm)	Velocity (m/s)  O O O	
STREAM	CHARACTER			+	HH	
Braided Riffle Run/Gilde Deep Pool (>= 0.5m) Shallow Pool (< 0.5m)  A = Absent P :	Gravel Sand Sitt/Clay Cobble Bedrock	Boulder >2m Boulder <2m Beaver Pond Overhead Cover Undercut Bank Orange Floc				
Woody Debris  No. of Instream Woody Debri  No. of Dewatered Woody Debri  No. of Dewatered Rootwads  COMMENTS;	Maximum Depth Wetted Thu Width (m) Depth		Alternative I Distance Depth (or Width (or	(om)	rements	

#### MBSS Summer Habitat Data Sheet

- Bank Erosion
- Bar Formation
- Habitat Assessment
- Stream Character
- Woody Debris
- Transect Measurements
- Stream Flow















No bank erosion

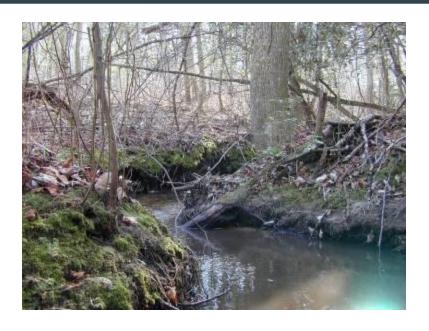
Extent = 0

Severity = 0 (none)

Average Height = 0









Minimum bank erosion

Extent = 10 m

Severity = 1

Average Height = 0.2 m









Moderate bank erosion

Extent = 40 m

Severity = 2

Average Height = 0.6 m











Severe bank erosion

Extent = 75 m

Severity = 3

Average Height = 2 m





#### MBSS SUMMER HABITAT DATA SHEET v. 2014 SITE Reviewer: FLOW BANK EROSION HABITAT ASSESSMENT 0 0 0 0 0 0 0 Instream Habitat (0-20). Extent (m) 2. Epifaunal Substrate (0-20) Severity \_\_\_ 0 = none 1 = min Velocity/Depth Diversity (0-20) 2 = mod4. Pool/Glide/Eddy Quality (0-20). Extent (m)-BAR FORMATION & 5. Riffle/Run Quality (0-20) SUBSTRATE Extent (m)-Embeddedness (%). Shading (%). STREAM CHARACTER Braided Gravel Boulder >2m Sand Boulder <2m Run/Glide Silt/Clay Beaver Pond Deep Pool (>= 0.5m) Cobble Overhead Cover Shallow Pool (< 0.5m) Bedrock Undercut Bank Orange Floc A = Absent P = Present E = Extensive Alternative Flow Measurements Woody Debris Maximum Depth (cm) Thalweg Thalweg No. of Instream Woody Debris Velocity (m/s) Depth (cm) No. of Dewatered Woody Debris Width (cm) No. of Instream Rootwads No. of Dewatered Rootwads COMMENTS: \_

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#### **BAR FORMATION &** SUBSTRATE Cobble Severity 0=none Gravel 1=min 2=mod Sand 3=extensive Silt/Clay

Characterize most dominant substrate type











Bar Formation = None







Bar Formation = Minor (Sand, Gravel)







Bar Formation = Moderate (Sand, Silt/Clay)







Bar Formation = Extensive (Cobble, Gravel, Sand, Silt/Clay)





#### MBSS SUMMER HABITAT DATA SHEET v. 2014 SITE Reviewer: FLOW BANK EROSION HABITAT ASSESSMENT 0 0 0 0 0 0 0 Instream Habitat (0-20) Extent (m) Epifaunal Substrate (0-20) Severity \_\_\_ 0 = none 1 = min 2 = modPool/Glide/Eddy Quality (0-20). Extent (m)-BAR FORMATION & Riffle/Run Quality (0-20) SUBSTRATE Cobble Severity \_\_\_\_ Gravel 1 = min Embeddedness (%) 2 = modSand Sit/Clay Shading (%). STREAM CHARACTER Braided Gravel Boulder >2m Riffle Sand Boulder <2m Run/Glide Silt/Clay Beaver Pond Deep Pool (>= 0.5m) Cobble Overhead Cover Shallow Pool (< 0.5m) Bedrock Undercut Bank Orange Floc A = Absent P = Present E = Extensive Alternative Flow Measurements Woody Debris Maximum Depth (cm) Distance (cm) Thalweg Thalweg No. of Instream Woody Debris Velocity (m/s) Depth (cm) No. of Dewatered Woody Debris Width (cm) No. of Instream Rootwads No. of Dewatered Rootwads COMMENTS: \_

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HABITAT ASSESSMENT
1. Instream Habitat (0-20)
2. Epifaunal Substrate (0-20)
3. Velocity/Depth Diversity (0-20)
4. Pool/Glide/Eddy Quality (0-20)
Extent (m)
5. Riffle/Run Quality (0-20)·····
Extent (m)
6. Embeddedness (%)
7. Shading (%)



#### MARYLAND DEPARTMENT OF NATURAL RESOURCES

#### MBSS Summer Habitat

Habitat Parameter	Optimal 16-20	Sub-Optimal 11-15	Marginal 6-10	Poor 0-5	
1. Instream Habitat <sup>(a)</sup>	Greater than 50% of a variety of cobble, boulder, submerged logs, undercut banks, snags, rootwads, aquatic plants, or other stable habitat	30-50% of stable habitat. Adequate habitat	10-30% mix of stable habitat. Habitat availability less than desirable	Less than 10% stable habitat. Lack of habi- tat is obvious	
2. Epifaunal Substrate <sup>(b)</sup>	Preferred substrate abundant, stable, and at full colonization potential (riffles well developed and dominated by cobble; and/or woody debris prevalent, not new, and not transient)	Abund. of cobble with gravel &/or boulders common; or woody de-bris, aquatic veg., undercut banks, or other pro-ductive surfaces common but not prevalent /suited for full colonization	Large boulders and/or bedrock prevalent; cobble, woody debris, or other preferred surfaces uncommon	Stable substrate lacking; or particles are over 75% surrounded by fine sediment or flocculent material	
3. Velocity/Depth Diversity <sup>(c)</sup>	Slow (<0.3 m/s), deep (>0.5 m); slow, shallow (<0.5 m); fast (>0.3 m/s), deep; fast, shallow habitats all present	Only 3 of the 4 habitat categories present	Only 2 of the 4 habitat categories present	Dominated by 1 velocity/depth category (usually pools)	
4. Pool/Glide/Eddy Quality <sup>(d)</sup>	Complex cover/&/or depth > 1.5 m; both deep (> .5 m)/shallows (< .2 m) present	Deep (>0.5 m) areas present; but only moderate cover	Shallows (<0.2 m) prevalent in pool/glide/eddy habitat; little cover	Max depth <0.2 m in pool/glide/eddy habitat; or absent completely	
5. Riffle/Run Quality <sup>(s)</sup>	Riffle/run depth generally >10 cm, with maximum depth greater than 50 cm (maximum score); substrate stable (e.g. cobble, boulder) & variety of current velocities	Riffle/run depth generally 5-10 cm, variety of current velocities	Riffle/run depth generally 1-5 cm; primarily a single current velocity	Riffle/run depth < 1 cm; or riffle/run substrates concreted	
6. Embeddedness <sup>(f)</sup>	Percentage that gravel, cobble, and boulder particles are surrounded by line sediment or flocculent material.				
7. Shading <sup>(g)</sup>		that is shaded (duration mmer; 100% = fully and d			
8. Trash Rating <sup>(h)</sup>	Little or no human refuse visible from stream channel or riparian zone	Refuse present in minor amounts	Refuse present in moderate amounts	Refuse abundant and unsightly	





#### Instream Habitat - Habitat quality as it relates to fishes

Habitat Parameter	Optimal	Sub-Optimal	Marginal	Poor
	16-20	11-15	6-10	0-5
1. Instream Habitat <sup>(a)</sup>	Greater than 50% of a variety of cobble, boulder, submerged logs, undercut banks, snags, rootwads, aquatic plants, or other stable habitat	30-50% of stable habitat. Adequate habitat	10-30% mix of stable habitat. Habitat availability less than desirable	Less than 10% stable habitat. Lack of habitat tat is obvious





#### **Instream Habitat**



03/19/2018

Optimal 16-20

Greater than 50% of a variety of cobble, boulder, submerged logs, undercut banks, snags, rootwads, aquatic plants, or other stable habitat

Score = 20

Sub-Optimal 11-15

30-50% of stable habitat. Adequate habitat

Score = 14





#### **Instream Habitat**





Marginal 6-10

10-30% mix of stable habitat. Habitat availability less than desirable Score = 8

Poor 0-5

Less than 10% stable habitat. Lack of habitat is obvious

Score = 4





#### **Epifaunal Substrate** - Habitat quality as it relates to benthic macroinvertebrates

MBSS Stream Habitat Assessment Guidance Sheet					
Habitat Parameter	Optimal 16-20	Sub-Optimal 11-15	Marginal 6-10	Poor 0-5	
2. Epifaunal Substrate <sup>(b)</sup>	Preferred substrate abundant, stable, and at full colonization potential (riffles well developed and dominated by cobble; and/or woody debris prevalent, not new, and not transient)	Abund. of cobble with gravel &/or boulders common; or woody de-bris, aquatic veg., under- cut banks, or other pro-ductive surfaces common but not prevalent /suited for full colonization	Large boulders and/or bedrock prevalent; cobble, woody debris, or other preferred surfaces uncommon	Stable substrate lacking; or particles are over 75% surrounded by fine sediment or flocculent material	





#### **Epifaunal Substrate**



Preferred substrate abundant, stable, and at full colonization potential (riffles well developed and dominated by cobble; and/or woody debris prevalent, not new, and not transient)

**Optimal** 

Score = 19



Abund. of cobble with gravel &/or boulders common; or woody de-bris, aquatic veg., undercut banks, or other pro-ductive surfaces common but not prevalent /suited for full colonization

Sub-optimal Score = 14





#### **Epifaunal Substrate**



Large boulders and/or bedrock prevalent; cobble, woody debris, or other preferred surfaces uncommon

Marginal Score = 8



Stable substrate lacking; or particles are over 75% surrounded by fine sediment or flocculent material

Poor Score = 2





#### **Velocity/Depth Diversity** – Based on the variety of velocity/depth regimes present at a site

	MBSS Stream Habitat Assessment Guidance Sheet				
Н	labitat Parameter	Optimal 16-20	Sub-Optimal 11-15	Marginal 6-10	Poor 0-5
3.	Velocity/Depth Diversity <sup>(c)</sup>	Slow (<0.3 m/s), deep (>0.5 m); slow, shallow (<0.5 m); fast (>0.3 m/s), deep; fast, shallow habitats all present	Only 3 of the 4 habitat categories present	Only 2 of the 4 habitat categories present	Dominated by 1 ve- locity/depth category (usually pools)



#### **Pool/Glide/Eddy Quality** – Based on the depth and spatial complexity of slow water habitat present at site

MBSS Stream Habitat Assessment Guidance Sheet				
Habitat Parameter	Optimal 16-20	Sub-Optimal 11-15	Marginal 6-10	Poor 0-5
4. Pool/Glide/Eddy Quality <sup>(d)</sup>	Complex cover/&/or depth > 1.5 m; both deep (> .5 m)/shallows (< .2 m) present	Deep (>0.5 m) areas present; but only moderate cover	Shallows (<0.2 m) prevalent in pool/glide/eddy habitat; little cover	Max depth <0.2 m in pool/glide/eddy habitat; or absent completely





**Riffle/Run Quality** – Based on the depth, complexity, and functional importance of riffle/run habitat present at site

Habitat Parameter	Optimal	Sub-Optimal	Marginal	Poor
	16-20	11-15	6-10	0-5
5. Riffle/Run Quality <sup>(e)</sup>	Riffle/run depth generally >10 cm, with maximum depth greater than 50 cm (maximum score); substrate stable (e.g. cobble, boulder) & variety of current velocities	Riffle/run depth generally 5-10 cm, variety of current velocities	Riffle/run depth generally 1-5 cm; primarily a single current velocity	Riffle/run depth < 1 cm; or riffle/run substrates concreted

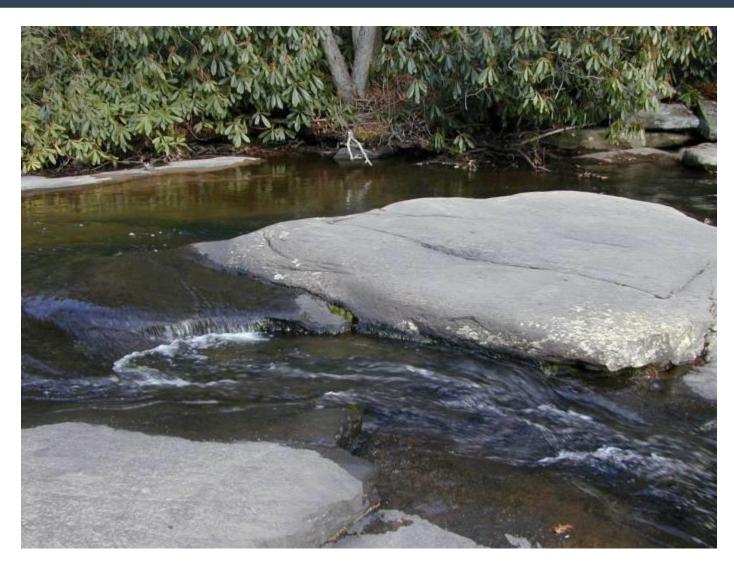


**Embeddedness** – Measured at fastest flowing section in the 75 m site

c	Emboddodnoss <sup>(f)</sup>	Percentage that gravel, cobble, and boulder particles are surrounded by line sediment or	1
0.		flocculent material.	







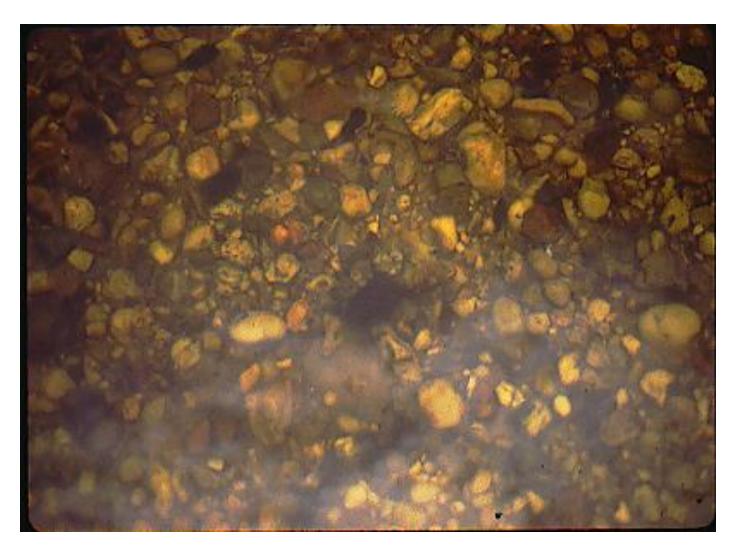






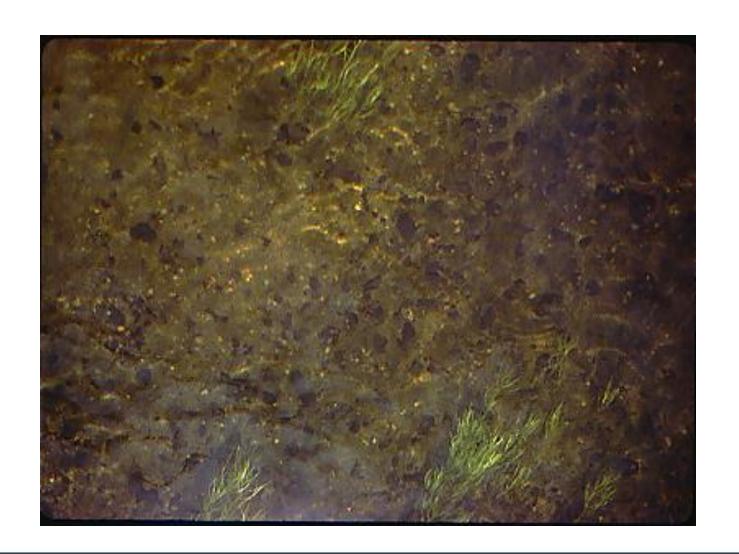






















**Percent Shading** – Rated based on degree and duration of shading at a site throughout the day

7. Shading<sup>(g)</sup>
Percentage of segment that is shaded (duration is considered in scoring). 0% = fully exposed to sunlight all day in summer; 100% = fully and densely shaded all day in summer

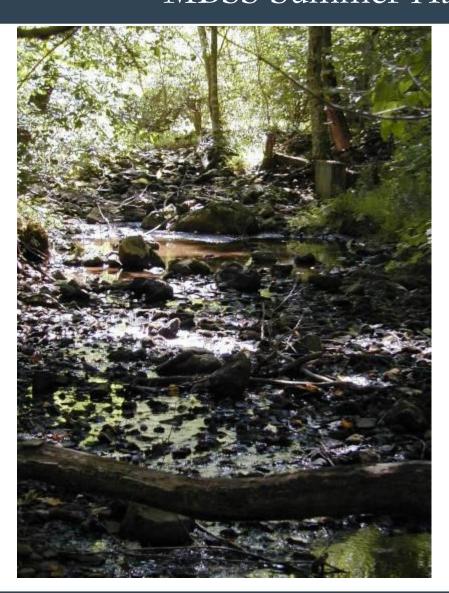






















#### MBSS SUMMER HABITAT DATA SHEET v. 2014 SITE Reviewer: FLOW BANK EROSION HABITAT ASSESSMENT 0 0 0 0 0 0 0 Instream Habitat (0-20). Extent (m) 2. Epifaunal Substrate (0-20) Severity \_\_\_ 0 = none 1 = min Velocity/Depth Diversity (0-20) 2 = mod4. Pool/Glide/Eddy Quality (0-20). Extent (m)-BAR FORMATION & 5. Riffle/Run Quality (0-20) SUBSTRATE Extent (m)-Cobble Severity \_\_\_\_ Gravel 1 = min Embeddedness (%). 2 = modSand 7. Shading (%). STREAM CHARACTER Braided Boulder >2m Boulder <2m Silt/Clay Run/Glide Beaver Pond Deep Pool (>= 0.5m) Overhead Cover Shallow Pool (< 0.5m) Undercut Bank Orange Floc A = Absent P = Present E = Extensive Alternative Flow Measurements Woody Debris Maximum Depth (cm) Thalweg Thalweg No. of Instream Woody Debris Velocity (m/s) Depth (cm) No. of Dewatered Woody Debris Width (cm) No. of Instream Rootwads No. of Dewatered Rootwads COMMENTS: \_

- Bank Erosion
- Bar Formation
- Habitat Assessment
- Stream Character
- Woody Debris
- Transect Measurements
- Stream Flow





STRE	AM CHARACTER	
Braided	Gravel	Boulder >2m
Riffle	Sand	Boulder <2m
Run/Glide	Silt/Clay	Beaver Pond
Deep Pool (>= 0.5m)	Cobble	Overhead Cover
Shallow Pool (< 0.5m)	Bedrock	Undercut Bank
		Orange Floc
A = Absent	P = Present	E = Extensive



v. 2014 MBS	SS SUMMER	R HABITAT DA	ATA SHEET	Page of
SITE Watershed Code	Segment Type	Year	Reviewer:	Second /
BANK EROSION Left Bank Right Ban Extent (m)  Severity 0 = none 1 = rink 2 = rind 3 = severe  Average Height (m)  BAR FORMATION & SUBSTRATE  Severity 0 = none 1 = rink 2 = rind 3 = severe	1. Instream Habita 2. Epifaunal Subs 3. Velocity/Depth I 4. Pool/Gilde/Edd Extent (n 5. Riffle/Run Qual Extent (n 6. Embeddedness		Lat Loc. (m) Depth (	om) Velocity (m/s)
	M CHARACTER			
Braided Riffle Run/Gilde Deep Pool (>= 0.5m) Shallow Pool (< 0.5m)  A = Absent	Gravel Sand Sitt/Clay Cobble Bedrock  P = Present	Boulder >2m Boulder <2m Beaver Pond Overhead Cover Undercut Bank Orange Floc E = Extensive		
Woody Debris  No. of Instream Woody Debris  No. of Dewatered Woody  No. of Instream Rootwad  No. of Dewatered Rootwad  COMMENTS:	Maximum Dobbris Wetsed Width (m)  y Debris		Alternative Flow M  Distance (cm)  Depth (cm)  Width (cm)  Time (sec) 1.  2.  3.	leasurements

- Bank Erosion
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## Woody Debris No. of Instream Woody Debris No. of Dewatered Woody Debris No. of Instream Rootwads No. of Dewatered Rootwads

#### Large Woody Debris

- 10 cm diameter
- 1.5 m long

#### Rootwads

- 15 cm DBH

#### Instream

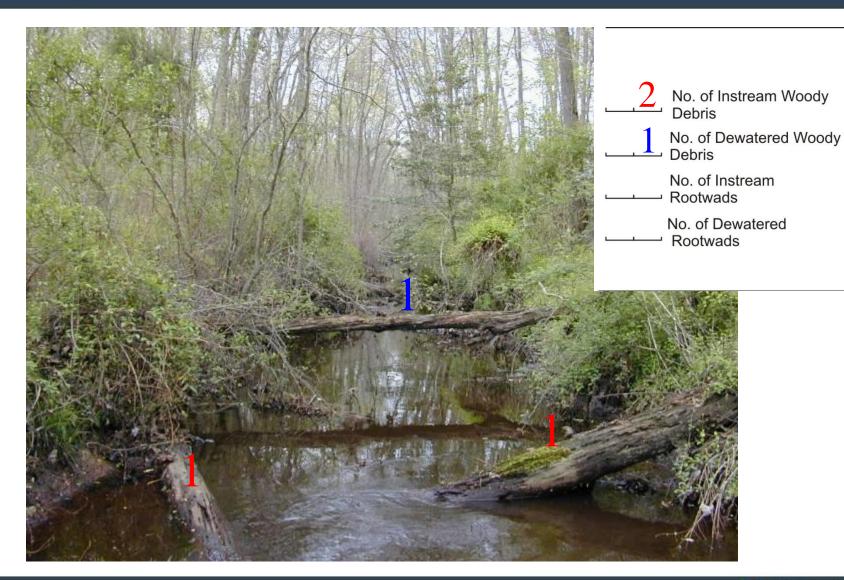
- In direct contact with water

#### Dewatered

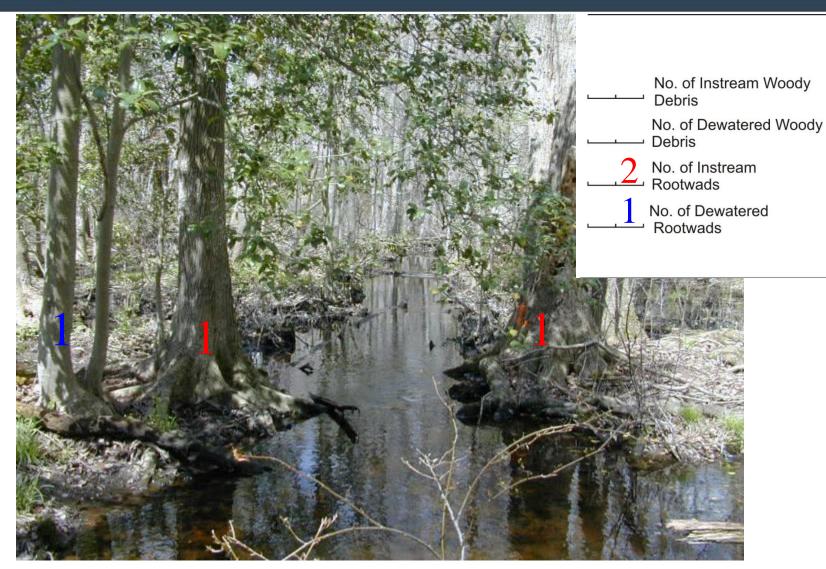
- Potential to enter stream









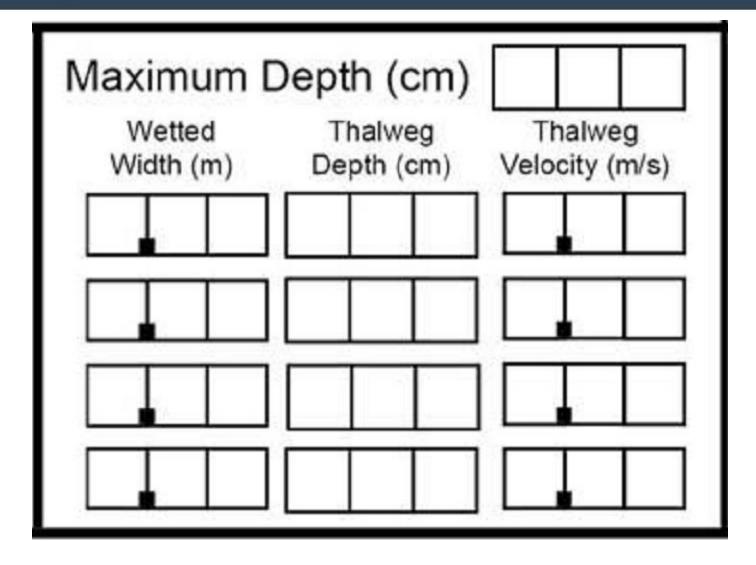




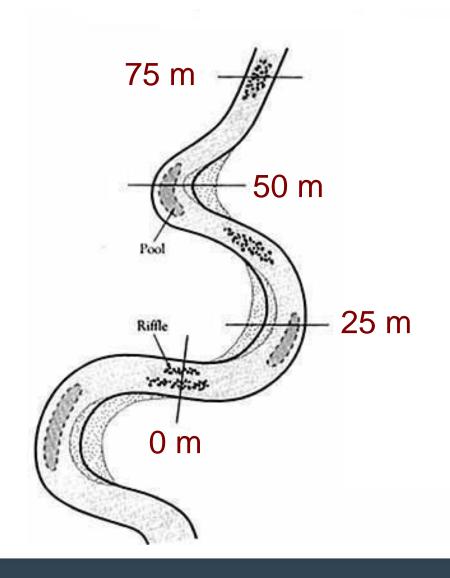
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Thalweg Depth (cm)





MBSS SUMMER HABITAT DATA SHEET Page				
SITE Watershed Code	Segment Type	Year	Reviewer:	rst Second
BANK EROSION Left Bank Right Bank Extent (m)  Severity 0 = none 1 = rin 2 = mod 3 = sovere  Average Height (m)  BAR FORMATION & SUBSTRATE  Severity 0 = none 2 = rod 3 = sovere SilvClay	Instream Habitat     Epifaunal Substra     Velocity/Depth Di     Pool/Glide/Eddy (     Extent (m)      Riffle/Run Quality     Extent (m)      Extent (m)      Embeddedness (*	oue (0-20)	Lat Los. (m)	PLOW Depth (cm) Velocity (m/s) 0 0 0 0 0
STREAM	CHARACTER			
Braided Riffle Run/Gilde Deep Pool (>= 0.5m) Shallow Pool (< 0.5m)  A = Absent P =	Gravel Sand Sitt/Clay Cobble Bedrock  Present E	Boulder >2m Boulder <2m Beaver Pond Overhead Cover Undercut Bank Orange Floc  = Extensive		
Woody Debris  No. of Instream Woody Debri  No. of Dematered Woody Debri  No. of Instream Rootwads  No. of Dematered Rootwads  COMMENTS:	Width (m)	Dith (cm) Thalweg Appth (cm) Velocity (m/b)	Alternative Distanc Depth ( Width (	om)
COMMENTS:				

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#### Velocity measurements should be taken:

- Measured at 0.6 depth with sensor oriented parallel to flow
- Stand downstream to avoid deflection of flows!



Alternative Flo	w Measurements
Distance (cm	)
Depth (cm)	
Width (cm)	
Time (sec)	1.
	2.
	3.

- Constrict stream in a one meter section of uniform depth and width
- Record speed of floating object (e.g. leaf, stick, or trash) over a one meter distance
- Repeat three times



MBSS SUMMER HABITAT DATA SHEET Page of				
SITE Watershed Code S	egment Type	Year	Reviewer:	Second /
BANK EROSION Left Bank Right Bank Extent (m)  Severity 0 = none 1 = rain 2 = rrain 2 = rrain BAR FORMATION & SUBSTRATE  Severity 0 = none 1 = rain SUBSTRATE  Severity 0 = none 1 = none 1 = none 1 = none 3 = severe SibiClay	Instream Habita     Epifaunal Subsi     Velocity/Depth (     Pool/Gilde/Edd)     Extent (n     Riffle/Run Qual		Lat. Loc. (m)	FLOW Depth (cm) Velocity (mis) 0 0 0 0 0 0 0 0
Braided Riffle Run/Gilde Deep Pool (>= 0.5m) Shallow Pool (< 0.5m)	CHARACTER  Gravel Sand SittiClay Cobble Bedrock  Present	Boulder >2m Boulder <2m Boulder <2m Beaver Pond Overhead Cover Undercut Bank Orange Floc E = Extensive		
Woody Debris  No. of Instream Woody Debris  No. of Dewatered Woody Deb  No. of Instream Rootwads  No. of Dewatered Rootwads	Width (m)	epth (cm) Thalweg Depth (cm) Velocity (m/s)	Alternative F Distance ( Depth (on Whith (or Time (sec	0
Be sui	e to	o coi	nm	ent!

Any impacts associated with habitat conditions at a site should be documented in the comments section

